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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,062	06/29/2005	Denise Marian Bakker	4662-34	6108
23117 7590 06/18/2009 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
NDUBIZI, CHUKA CLEMENT				
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3743				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/541,062

**Applicant(s)**

BAKKER ET AL.

**Examiner**

CHUKA C. NDUBIZU

**Art Unit**

3743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on through march 25 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 2 and 3 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 5, 7-11 and 15 is/are rejected.
- 7) ☐ Claim(s) 6, 9, 12-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 25 2009 has been entered.

### ***Claim Objections***

Claim 7 is objected to because of the following informalities: Line 14 recites "use a" instead of "use as" Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 7, 10 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 7 recites "receives and heat exchanges the flue gases .... with fresh air ....". It is not clear what Applicant means. For the purposes of Examination it is assumed that claim 7 recites "receives flue gases discharged from the second heat exchange unit and exchanges heat with fresh air ...."

Claim 10 recites "directing heated fresh air from the second heat exchange unit ..... therein". However heated fresh air comes from the third heat exchange unit and not from the second. For the purposes of examination it is assumed that the claim recites "directing heated fresh air from the third heat exchange unit ..... therein".

Claim 15 recites "receives and heat exchanges the flue gases ..... exchange unit". It is not clear what Applicant means and Examiner finds it hard to guess what Applicant means.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 1 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al 5,247,907 in view of Hardeveld 4,408,046. Lee teaches the invention as

claimed (fig 1), a process furnace F (Lee discloses that F can be used to heat process and/or utility streams (column 5 lines 48-53). Hence the furnace is capable of being used for heating salt (process/utility) for the production of melamine.); that is operated with a fuel (column 3 lines 34-35) resulting in flue gases (column 3 lines 47-50), the process comprising; providing a furnace which is capable of being part of a melamine production process, the furnace combusting a fuel thereby resulting in flue ,gases (column 3 lines 47-50); a first heat exchange step (at 30) in which the flue gases (see the arrows at 14 after the heater 16) are heat exchanged with a process/utility stream (which can be molten salt from the melamine production process to form a heated molten salt that provides process heat for the melamine production process); a second heat exchange step after the first heat exchange step (at 32) wherein the flue gases discharged from the first heat exchange step are subsequently heat exchanged with a second process stream (at 32) (from a processing facility which could be the melamine production processing facility); a third heat exchange step wherein the flue gases discharged from the second heat exchange step are heat exchanged with fresh air 108 (at 38) so as to provide heated fresh air; and directing the heated fresh air (through 110 and 105 )to the furnace for use as combustion air.

However, Lee does not specifically teach that the furnace is a salt furnace for production of melamine and in the first heat exchange step the flue gases exchange heat with molten salt; although Lee's furnace is capable of being used for melamine production since he disclosed that it is useful in a variety of chemical process facilities and for production of utility/process streams (column 5 lines 48-53).

Hardeveld teaches a process for making melamine comprising a first heat exchange unit wherein heat is exchange in the furnace with molten salt. Hardeveld is silent on whether the furnace produces flue gases even though his fig 1 shows a furnace 9 with a flue stack. However it is well known in the art that combustion furnaces that produce flue gases are used in melamine production (see for example Hood 2,776,284 (column 4 lines 9-15))

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lee's unit by exchanging heat with molten salt in the first unit of Lee's furnace which is meant for processing facilities in order to produce molten salt for any applications including making melamine as taught by Hardeveld (fig 1).

With regard to claim 15, since it is not clear what the Applicant means in this claim, nonetheless, it is assumed that Lee in view of Herdeveld teach the limitations of the claim since Lee discloses several heat exchange units as shown in fig. 1 and all the units exchange heat with the flue gas.

Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al in view of Hardeveld. Lee teaches an apparatus for extracting heat from chemical process furnace flue gases (see fig 1), which is the same problem the current application is addressing. Lee teaches the invention as claimed (fig 1), an apparatus for the extraction of energy from flue gases of a chemical process furnace, the apparatus comprising, a furnace F operated by combustion and producing flue gases, (column 3 lines 34-35, column 3 lines 47-50), (Lee discloses that F can be used to heat process

and/or utility streams (column 5 lines 48-53). Hence the furnace is capable of being used for heating salt (process/utility) for the production of melamine.); the furnace further including a first heat exchange unit 30.

The recitations "salt furnace" and "in which a molten salt employed in a melamine production process is heated so as to provide heated molten salt which serves as a process heat supply in the melamine production process" are statements of intended use and therefore are given little patentable weight. It has been held that the recitation with respect to the matter in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex part Masham*, 2 USPQ2d 1647 (1987). In this case, Lee's furnace is capable of performing the recited function.

Lee further discloses a second heat exchange unit 32 which receives flue gases discharged from the first heat exchange unit (see fig 1) so as to directly or indirectly heat a process stream (which can be from the melamine production process) (column 5 lines 52-53); a third heat exchange unit 38 which receives flue gases discharged from the second heat exchange unit (see arrows) and exchanges heat with fresh air 108 to provide heated fresh air; and a supply line 110 , 105 to supply the heated fresh air to the furnace for use as combustion air therein (in burner e.g. 16).

However, Lee does not specifically teach that the furnace is a salt furnace for production of melamine and in the first heat exchange step the flue gases exchange heat with molten salt; but Lee's furnace is capable of being used for melamine production.

Hardeveld teaches a process for making melamine comprising a first heat exchange unit wherein heat is exchanged in the furnace with molten salt. Hardeveld is silent on whether the furnace produces flue gases even though his fig 1 shows a furnace 9 with a flue stack. However it is well known in the art that combustion furnaces that produce flue gases are used in melamine production (see for example Hood 2,776,284 (column 4 lines 9-15))

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lee's unit by exchanging heat with molten salt in the first unit of Lee's furnace which is meant for processing facilities in order to produce molten salt for any applications including making melamine as taught by Hardeveld (fig 1).

Claims 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al in view of Hardeveld. Lee teaches the invention as claimed (see fig 1). Lee discloses a process for optimizing an existing apparatus supplying process heat from flue gases (see fig 1) (which can be used in a melamine production process as discussed above), the process comprising: adding a second heat exchange unit 32 downstream of a first heat exchange unit 30 wherein combustion flue gases from a furnace are heat-exchanged with the second heat exchange unit receiving flue gases discharged by the first heat exchange unit for the direct or indirect heating of another process stream (see fig 1, column 5 line 52-53); adding a third heat exchange unit 38 downstream of the second heat exchange unit to receive flue gases discharged by the second heat exchange unit (see arrows) for heating fresh air 108, and directing heated fresh air from



the third heat exchange unit to the furnace (through 110, 105) for use as combustion air therein (see fig 1).

The recitations "of the melamine production process" " "with molten salt to provide heated molten salt that provides process heat in the melamine production process", n the melamine production process" are statements of intended use and therefore are given little patentable weight. It has been held that the recitation with respect to the matter in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex part Masham*, 2 USPQ2d 1647 (1987). In this case, Lee's furnace is capable of performing the recited function.

Hardeveld teaches a process for making melamine comprising a first heat exchange unit wherein heat is exchanged in the furnace with molten salt. Hardeveld is silent on whether the furnace produces flue gases even though his fig 1 shows a furnace 9 with a flue stack. However it is well known in the art that combustion furnaces that produce flue gases are used in melamine production (see for example Hood 2,776,284 (column 4 lines 9-15))

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lee's unit by exchanging heat with molten salt in the first unit of Lee's furnace which is meant for processing facilities in order to produce molten salt for any applications including making melamine as taught by Hardeveld (fig 1).

Claims 4, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Hardeveld and further in view of Wood et al 6,599,119. Lee in view of Hardeveld teaches the invention as claimed except for the second process stream consisting essentially of ammonia or urea.

Wood teaches a process and apparatus of extracting energy from flue gases (figs 1-4) wherein the flue gases exchange heat at the heat exchange unit 120 (fig 4) with ammonia 121.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lee in view of Hardeveld's process plant by making the second process stream ammonia in order to improve energy efficiency in Lee in view of Hardeveld's processing facility by preheating the ammonia with hot flue gases and thereby reducing energy consumption in the facility.

Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Hardeveld and further in view of Westfall 2,943,088.

Lee in view of Hardeveld teaches the invention as claimed except for the second process stream consisting essentially of urea.

Westfall discloses a processing plant wherein urea is heated in a kiln (heat exchanger) by flue gases (from flames) (column 3 line 58-63 and column 4 line 60-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lee in view of Hardeveld's process by including the second process stream consisting essentially of urea in order to improve energy efficiency in Lee in view

of Hardeveld's processing facility by preheating the urea with hot flue gases and thereby reducing energy consumption in the facility.

***Allowable Subject Matter***

Claim 6, 9, 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

Applicant's arguments filed on February 11 2009 have been fully considered but they are not persuasive. Applicant's invention has to do with extracting heat from flue gases and using the heat to preheat process streams and combustion air. Applicant's emphasis on applying this process in the production of melamine is deemed a matter of intended use which is given little patentable weight. Lee's process and apparatus is capable of being used in the production of melamine as explained above.

Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection. Lee discloses extraction of heat from flue gases by process streams and Hardeveld discloses salt, urea and ammonia as the process streams, hence Lee in view of Hardeveld disclose the limitations of the claims as discussed above. Lee in view of Hardeveld discloses extraction of heat to heat combustion air after two prior heat exchanges with process streams as discussed above.

Applicant's argument with regard to his invention affecting NOx production has been considered. It is not clear how extracting heat from flue gases at the third heat exchange unit to heat the combustion air would lead to NOx production not increasing. Extracting heat to heat the process streams and combustion air would improve thermal efficiency in the plant as Lee discloses (see Abstract). Applicant seems to suggest that the specific order the flue gases exchange heat with the process streams and the combustion air lead to enhanced efficiency without increasing NOx production, implying that if the order is different the result will be different. However, Applicant has not shown any evidence to support this suggestion. Nonetheless Lee discloses extraction of heat to heat combustion air after two prior heat exchanges with process streams as discussed above.

Applicant argued that Wood teaches using flue gas to preheat combustion air directly. However, this teaching was not borrowed from Wood since Lee teaches preheating the combustion air at the third heat exchange step. The teaching borrowed from Wood is that the second process stream is substantially ammonia.

After due consideration it is determined that Applicant's claims do not distinguish Applicant's invention over the prior art of record.

### ***Conclusion***

The prior art made of record in the attached USPTO 892 and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHUKA C. NDUBIZU whose telephone number is (571)272-6531. The examiner can normally be reached on Monday - Friday 8.30 - 4.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Rinehart can be reached on 571-272-4881. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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